THE ZOOLOGIST.

THIRD SERIES.

Vol. XIV.] AUGUST, 1890. [No. 164.

AN OBSERVATION UPON THE TOXIC PROPERTIES OF THE AMPHIBIAN INTEGUMENT.

By Professor G. B. Howes, F.L.S.

My friend Mr. E. B. Poulton, in his new and interesting work entitled 'The Colours of Animals,' while treating of warning colours in Amphibia, writes (p. 165):—"It is extremely probable that the well-known European Salamander (*Salamandra maculosa*) possesses some unpleasant attribute. I do not think, however, that there is any direct evidence for this." Having recently made an observation which bears upon the question, I submit it for what it may be worth; and I am the more encouraged to do so, as it involves the older topic of the poisonous property of the Anuran integument, and that as concerning the rare *Xenopus* (*Dactylethra*) *lævis*. The animal in question (a young female of 30 millim. from snout to vent) was generously given me by the Zoological Society of London in February last; and since that date it has been living in a fern-case, in amicable relationship with a *Bombinator*, a dozen Salamanders, and a Slow-worm. The Anura have been regularly fed on "blood-worms," the Urodeles on *Lumbricidæ*. My *Xenopus*, as is its wont, but very rarely leaves the water, and, during the five months which it has passed in my possession, the occasional visit of one or more Salamanders to the glass dish in which it lives has been a matter of little or no consequence. Upon one occasion I had the pleasure of seeing the Slow-worm drink of the water while it

ISH MUSEU

contained two Salamanders and the two Anura referred to. On the morning of June 10th, however, my *Xenopus* was found lying in the dish motionless and apparently dead, side by side with a dead Salamander (*S. maculosa*), whose contorted body betokened intense excitement. The Anuran, on being handled, was roused to tetanic movements of the distal parts of its hind limbs; respiration had well nigh ceased; and its fore limbs, which were thrust backwards to their utmost, so that they lay almost parallel with the long axis of the body, were, together with its head and trunk, rigid and benumbed. The little creature's eyes, which were starting from its head, were blinded as if in epilepsy, and its body was thickly clad in a profusion of mucus. Upon removing the last named and placing the animal in shallow water with its head above the surface resuscitation was induced, and in twenty-four hours it fully revived, except for a timorousness which it has since retained.

I had every reason to believe that my animals had not been tampered with; and, as there were no signs of general disturbance, disorder and death from mutual poisoning naturally suggested itself. The body of the Anuran showed no perceptible sign of injury, such as might have been inflicted by the bite of the Salamander; but the mouth of the latter, which was full of mucus, contained a number of abraded epidermic cells, which, upon examination, proved to be those of the Frog. That the former animal had been endeavouring to swallow the latter would thus appear clear; that the mucus with which the Frog was besmeared had been secreted by its own skin was certain, from the glassy transparency and general aspects of the same; and the extraordinary backward thrust of its fore limbs already alluded to appear to me to point most naturally to an accommodating displacement within the jaws of its enemy.

The above facts, while they do not furnish the "direct evidence" sought by Mr. Poulton, show the mouth of the Salamander to have in all probability contained a toxic secretion. They speak most forcibly, however, for the "unpleasant attribute" of the skin of the Anuran. M. Paul Bert has shown, as is well known, that the "venom" of a toad, if administered to a fowl subcutaneously, will cause death, and the observation herein recorded points to the possession of a similar power by the skin of the rarer *Xenopus*.

The skin of the *Xenopus* was, as already stated, rendered glassy and transparent under the sudden drain upon its resources; and I was struck with the fact that certain dark blotches conspicuous upon it at other times were little perceptible, owing no doubt to the over-contraction of the chromatophores composing them. Concerning these darker areas of the Amphibian integument Mr. Poulton records some interesting observations, and while he concludes (p. 85) that a "connection between the nerves and the pigment-cells in the skin . . . appears to be rendered certain by the fact that light falling on the eye modifies the distribution of the pigment granules," he states that "the highest powers of the microscope, assisted by all the varied methods of histology, have failed to detect" it. There is, however, no reason for conjecture; for, while Leydig has seen and described the connection in Lizards, Ehrmann (Stzb. Wien Akad. Math. Nat. Cl. Bd. 84, Abth. 3, p. 165, 1881), and Haller (Zoolog. Anz. 1885, p. 611), have independently observed and figured it in the Common Frog.

SUPPLEMENTARY NOTES ON THE EVOLUTION OF BIRD-SONG.*

By Charles A. Witchell.

The imitative tendency of many species of wild birds is indicated by the mimicry of captive individuals, which is often very apparent, but is limited to imitations of noises with which they are familiar. Ornithological works generally do not distinguish with sufficient accuracy the songs of captive and wild individuals, which are not usually the same. It will be observed that the rearing of the young influences song; for, when this is about, some species, such as the Nightingale, Redstart, Willow Warbler, Chiffchaff, Wood Warbler, Blackbird, and Missel Thrush, utter very frequently their alarm-cries, and neglect their songs; while the Sky Lark and Tree Pipit fly less often during song, and in a great measure abandon those long-drawn notes (closely like the call-note of the young Sky Lark) which form in early spring the endings of their phrases. At the same time the

---

[*] See anteà, p. 233.

Starling also omits from his song the love-calls which in spring concluded his phrases, and were accompanied by a fluttering or flapping of the wings—a movement then indicative of ardent overtures to his mate. On the other hand, the Redstart and Common Flycatcher acquire a note, "chick" or "chick-ik," probably an alarm, uttered, as a rule, immediately after their short cries.

The similarity of certain cries of unimitative species may be of value as indicating a survival or modification from common originals; and a like resemblance is almost equally noteworthy when occurring in unvarying cries, such as alarms or call-notes, amongst species of extended song and mimicry; notwithstanding its occasional existence between the notes of birds widely distinct (*e.g.* Dunlin and Tawny Owl, Wryneck and Butcher-bird, Kittiwake and Peregrine Falcon), when it may possibly be due to the companionship of the birds in a remote period. Darwin mentions a Woodpecker of the plains that retains the note of its woodland congeners ('Origin of Species,' 6th ed., 142), and this bird, one of an unimitative race, contrasts in habit with the Dipper, a member of a family in which mimicry is prevalent.

The similar cries of certain nearly allied species seem generic, and appear to have descended in a pedigree of imitation, and in association with definite physical characteristics, from a common ancestor of the species; but there are instances in which similarity of voice is the closest bond between species of different genera. Among the raptorial birds, the notes of foreign and British Falcons and Hawks are generally described as shrill cries, screams, or shrieks; and those of foreign and British Owls are generally represented in words which imply long, hollow sounds. The shriek of the young Kestrel appears to be modified a little in the cries of the young and adult Butcher-bird; and the same character-sound, varied in pitch, constitutes the song of the Wryneck. The Butcher-bird's cry is strangely repeated by the young of the Great Titmouse, but is changed as the birds attain maturity. The song of the Wryneck is fairly like those of the Green Woodpecker and Tree Creeper, and the long notes of the Nuthatch. The call-notes of the Great Titmouse are heard in the Cole Titmouse, but the latter has a somewhat different, and, of course, much less powerful song. The song of the Blue Titmouse varies further from that of the Great Titmouse; but the three species have a common characteristic in the soft squeak which is their call-note, and, curiously, is sometimes repeated as a call-note by the Nuthatch, their frequent companion. The Long-tailed Titmouse, notwithstanding a close association with the others, has not acquired one of their notes, but has cries which are noticeably like those of the Squirrel.*

In the *Corvidæ* we have the croak of the Raven modified to "corrr" in the Crow; "caw" in the Rook; and "jack," and otherwise varied, in the Jackdaw. The same character-cry, "cah," is uttered by the Jay as a frequent alarm, and it occurs in the Starling as an alarm to the young, and at other times to indicate extreme terror. The construction of the Magpie's alarm by a repetition of "cah" has been suggested. I have heard a Missel Thrush utter "cah" when carrying food, apparently to its young. It is a question whether the single note of which the rattling alarms of the Missel Thrush, Blackbird, and Ring Ouzel, and the "took-took" of the Fieldfare are composed, is not, with the soft "click" of the Thrush, an abbreviation of the same broad sound.

The cries of the nestling young of the Starling and Rook are much alike. In spring the male Starling calls the female by repeating a loud, long-drawn, squealing note, uttered in moments of the greatest vehemence, and when the female approaches. This note is common to every male, and is quite distinct from the general character of the song. It is closely like the migratory cries of the Thrush, Redwing, and Blackbird (which cries are much the same, but distinguishable), and the cry of the young Thrush, and that of the nestling Blackbird. This long, plaintive note is uttered by the male Blackbird when the nest or young have been disturbed, and sometimes before rain in autumn, and during prolonged frost. A note almost identical, seeming to differ only in its lack of force, is uttered by the Redbreast upon exactly the same occasions, and, in addition, sometimes before song on very damp autumn days. The Redbreast appears to often abbreviate this note to a short squeak, very like the squeak of the Flycatcher. The rattling alarm of the Blackbird is reproduced on a smaller scale (if we may so employ the term), and on the same occasions, by the Redbreast; but the former bird varies the pitch of it in a much greater degree than the latter. In both it is often accompanied by a flirt of the tail. In the Redstart the extent of the repetition of this alarm is generally limited to one or two, or perhaps three or four, short notes; while these occur singly and are slightly modified in the "chick" of the Flycatcher.

---

* The retention of these cries, uninfluenced by others, may be due to the gregarious habits of each family of this species.

One of the most noticeable cries of the Redstart is "tewy," preceding its "tit" or "chick" alarm, just noticed. This "tewy" is reproduced, almost exactly, as one of the alarms of the Whitethroat; as an alarm and call-note by the Chiffchaff and Willow Warbler; and is uttered in the songs of the Nightingale (frequently its first note), Redstart, Blackcap, Whitethroat, and Sedge Warbler. I have heard a Nightingale prolong this cry, in a succession of rapid repetitions, into the well-known long notes of the species. The long notes of the Wood Warbler, and the whole song of the Willow Warbler seem to have originated, like the note of the Nightingale, in mere prolongations of this cry; and the effect of vocal cultivation among captive birds (and human beings) gives colour to the surmise that the repetition of this mellow note may have tended to produce the fine tones of the Nightingale and Wood Warbler. The cricket-like chirp which is uttered after the usual notes of the Chiffchaff is somewhat like the single cries that form, rapidly repeated, the sibilant phrases of the Wood Warbler and Grasshopper Warbler. The croak of the Nightingale seems to be abbreviated in the "quare" alarm of the Whitethroat, and the Blackcap's "tack": forming an analogue to the croak, "caw," and "jack" of the Raven, Rook, and Jackdaw (*antea*).

The coarse "jig-jig" notes in which the Swallow ends its phrases are heard much more frequently in those of the Martin and Sand Martin, but are never uttered by the Swift.

The Finches have many similar cries; and those of the Greenfinch may be considered as typical. These are: "did-it, it-it" and "tell-tell" in the young, and in addition "tewy" and "zshwéo" in the adult male. The "did-it" is the common call of the adult male and female, and of the Goldfinch and Siskin. It is seemingly modified in the loud and frequent "philip" call-note of the young and the adult male House Sparrow, and in that often exact but softer reproduction of the House Sparrow's note by the young and adult male and female Chaffinch; the last employing it in spring both as a call for each other and for their young. The "did-it" of the Greenfinch seems to be contracted by the Yellow Bunting and Cirl Bunting into two very rapid notes which are uttered almost at once, as a common call.

"Tell-tell" is heard in the young and adult Linnet; and is, with them, always a call-note. It is much varied by the male House Sparrow, and is uttered by this bird both in song and as a warning, sometimes being very rapidly repeated. It is also heard in the songs of the Goldfinch and Siskin, and appears to be modified in the "pink" of the Chaffinch. The "tewy" of the adult Greenfinch is very closely repeated as a love-call by the female House Sparrow, and is employed by her, in a modified tone, as an alarm-call-note.

The strange note "zshwéo" is uttered by the adult male Greenfinch alone or at the end of a phrase; it seems to be never addressed to the female; but the rattling together of the mandibles during combat produces a similar sound. It is absent from the voice of the House Sparrow, but is heard in the songs of the Linnet, Goldfinch, and Siskin; and is employed by the Goldfinch during combat. The penultimate syllable (to borrow a term) of the song of the Chaffinch is generally, but not always, a hard note, higher than the concluding notes, and apparently it is an abbreviation of "zshwéo." The "zurse" common note of the Yellow Bunting may have had the same origin. One of the notes of the Reed Bunting is very like the "pink" of the Chaffinch. A brown migratory finch, larger than the Goldfinch, and very wild, feeding in March on the larches near Stroud, has all the above cries of the Greenfinch, but a coarser "zshwéo." I have been unable to identify this bird.

The "coos" of the Stock Dove, Cushat, Turtle Dove, and Collared Turtle Dove betray a family resemblance, but it will be noticed that the short, jerky notes of the Stock Dove are not unlike the cries which form "cuckoo." The note of the Hoopoe may have the same character.

It appears that many of the *Anatidæ* are described as uttering whistling cries, and I have noticed that the cry of the Common Sheldrake is closely like the cries of the young of the Common Duck and Mute Swan. I have heard few of the *Rasores*, but may remark that the "crow" of the Pheasant, of a persistent character, resembles that of the common cock; that the alarm-yell of the latter is closely like the pæan of the Peacock; and that the chicken, young pheasant and partridge have a similar note.

The main purpose of this supplement is to show that there are certain apparently unvaried cries common to several species of wild birds; that the most prevalent note of a species may be modified in its congeners, or supplanted by other cries which then predominate, and are in their turn abandoned by other birds. I am not in a position to trace structural development in analogy or contradiction to the suggestions of vocal resemblance; but some evident outward features of similarity between birds with similar cries, as the speckled breast of the young of the Redbreast, Redstart, Thrush, and Blackbird must be familiar to all my readers.

I am conscious that my work in Bird-song is very imperfect, but shall hope for ability and opportunity to render it more complete.

NATURAL HISTORY NOTES FROM SUFFOLK.

By G. T. Rope.

The following fragmentary Natural History jottings were principally made during a stay of some three months at Iken, on the River Alde, Suffolk, during the spring of 1888, and mostly relate to that place and its immediate neighbourhood. They contain, I fear, little of interest, and those only who can derive as much pleasure from watching the ways of the commoner animals as from the acquisition (and consequent destruction) of rarities will care to glance at them.

The parish of Iken is situated at the widest part of the river, which becomes here, at high tide, a fine sheet of water, extensive mud-flats being left exposed as the tide recedes. There is a decoy for wildfowl in the parish, which is still worked, and the winter of 1887-8, just previous to my visit, was a fairly successful one. At Black Heath, Friston, on the opposite side of the river, is a large heronry. A considerable proportion of the parish of Iken is heath land, forming part of that irregular belt of heath which runs parallel to the coast-line of Suffolk, with occasional interruptions from the Orwell to Breydon Water. About the heath are scattered a few small fir plantations. Iken Wood, situated on low ground where the heath and marshes join, contains some fine old hollies; but the majority of the trees (oaks) are small and stunted in growth, probably from poverty of soil and exposure to the full power of the biting east winds of early spring. Part of a much larger wood (Sudbourne great wood) lies, I believe, within the Iken boundary, or at any rate approaches it very closely. About the meadows, near the decoy, are some alder "cars," as well as a few large single alders scattered here and there. There is still a fair amount of hedge-row timber, though it has been sadly thinned of late years; yet this parish has suffered less from "improvements" than many in the neighbourhood. There is a good deal of marsh land alongside the river, protected in most places by artificial banks or "walls," but at Iken Cliff the heath comes right down to the water, ending in low sandy cliffs. Here a colony of Sand Martins has been established for years; a few pairs of Starlings occupy some of their holes during the breeding season, and Kingfishers occasionally make use of one as a nesting-place. The opposite bank of the river is of similar character, but generally flatter. On the heath at Iken, near the water's edge, grow two clumps of oaks, and at this spot a sandy beach is left bare at low water; but in most places a fringe of saltings, of varying width, extends along the river, and is much frequented by Redshanks and their young. Peewits used to breed in great numbers about the marshes and on bare parts of the heath, but, having been robbed year after year of their eggs, they have been gradually driven away from their old haunts, till there are only a few pairs left.

On the whole this spot seems admirably suited to the requirements of birds of many kinds, differing widely in habits; but to such a pitch has game preserving been brought in this part of the county, that most rapacious birds and mammals have been almost exterminated. Some idea of the scarcity of hawks of all kinds may be gathered from the fact that, during the three months I remained at Iken, I only saw two,—a Kestrel, and, I think, a Sparrowhawk,—yet only a few years back Kestrels were common enough, and several might often be seen simultaneously poised aloft over the marshes, on the look-out for Moles, Field Voles, &c. Stoats, Weasels, Hedgehogs, and Jays, we rarely, if ever, get sight of now; and as to Magpies, one would almost as soon expect to stumble upon a specimen of the Dodo as to meet with one of these beautiful, but zealously persecuted, birds. Yet so lately as twenty or thirty years ago a few Magpies were not unfrequently seen about the heath, while Jays were fairly numerous. For miles around, large game-preserving estates extend; and the havoc wrought by keepers among such creatures as the above would hardly be believed by those who have not been obliged to witness it.

March, 1888.

16th. Wind north, with sleet and snow. While feeding some ducks this morning, two Great Tits, two Blue Tits, a Coal Tit, and a Marsh Tit attended to receive their share of maize; the last-named little bird being decidedly the boldest, and the first to seize and carry off a grain. A Robin and a Hedgesparrow also came; the former went so far as to pick up a small grain of maize, but dropped it directly. Tits of some of the above species come regularly every morning, evidently looking upon the call intended for the ducks as a summons to their own breakfast. A pair of Marsh Tits are the most constant attendants, and, as I have always found to be the case, are particularly bold and fearless, even surpassing in that respect the fussy Blue Tit. The Great Tit is the most wary and distrustful of all, and cares less for maize than the rest. The manner of proceeding with all four species is to hang about the neighbouring trees and bushes, gradually working their way towards the feeding-ground; then, watching for a favourable opportunity, they drop down, snatch up a grain, and fly off to some bush close by, where they quickly peck out and devour the middle part, and, letting fall the rest, return for another grain.

28th. Frog's spawn seen to-day for the first time. After the long, cold winter, the Frogs here were very late in spawning, and the same may be said of last season, when I first noticed spawn in the ditches on the 22nd. The earliest date on which I have seen *Rana temporaria* in the water is February 23rd, having found one in a pond at Blaxhall on that day, in the year 1882. In very early seasons, when a continuance of warm sunshine tempts the frogs into the water before their usual time, it sometimes happens that a severe frost sets in after they have spawned, and the shallow pools and ditches chosen for this purpose become frozen completely through. On the other hand, in warm dry seasons we sometimes see the water all dried up before the tadpoles are hatched; but so enormous is the fecundity of these animals that such accidents do not probably (except in extreme cases) affect to any great extent the general frog population. Possibly the gelatinous substance enclosing the embryo may have some power of protecting it from the frost.

29th. Both Frogs and Toads were heard croaking this evening in the ditches for the first time, though both had been in the water some while. Frog's spawn now abundant.

31st. Saw two Wheatears near Iken Wood. Later on a good many pairs frequented the heath, and were often to be found feeding at the water's edge, among sea-weed cast up by the tide. The earliest arrival of this bird I have a note of is March 2nd, in the year 1871, when I saw a solitary Wheatear at Leiston. In this part of Suffolk this is one of the very first to arrive of our spring migrants.

APRIL.

4th. Wind north, with snow. Saw a Wheatear on the mud at the water's edge, and a number of Redshanks about the saltings. Heard some Curlews calling down the river. Notwithstanding the coldness of the weather, a Yellowhammer was singing on the heath.

5th. Wind east, very cold, but bright. My dog found two Lizards (*Zootoca vivipara*) on the river "wall" between Snape and Iken. They both snapped their tails off, and escaped before I came up; and, but for the lively movements of those appendages, which remained jumping merrily about, I should not have known what the dog had found. Considering the coldness of the season it is unusual, according to my experience, to find Lizards abroad so early in the year. In the present instance both were found on the leeward side of the wall, which just here sloped directly towards the sun. Lizards were formerly very abundant about the heath near Blaxhall, but now one rarely sees them. It is difficult to account for their disappearance, unless it be that the Pheasants, which are very numerous, have cleared them off. Vipers too were, I feel sure, commoner twenty or thirty years back. These latter reptiles are sometimes carried during the winter into farmyards, secreted among the whin, heather, brakes, &c., which are brought in large quantities from the heath, to serve as litter, firing, &c. The common Ringed Snake is quite a rarity in this part of the county, though not uncommon in the neighbourhood of Ipswich.

6th. Saw a male Redstart this morning, sitting on the door of a shed, the earliest arrival of this species of which I have any note.

10th. Wind N.E., with snow, very cold. A Lark was running about just under my window, with feathers puffed out from cold, and looking very feeble. A pair of Starlings, too, seemed much pinched by the severity of the weather, and were unusually tame. A few Yellowhammers were daily to be seen about some old threshing-machines, searching for stray grains of corn; at present they are much commoner here than Sparrows. A Grey Crow flew along the river this morning, cawing in a peculiar chattering manner. Compared with the Rook, some at least of these Crows must be late breeders. I have known them to remain here as late as April 14th.

12th. A single Grey Crow seen again to-day. In Suffolk, especially about the heaths and marshes near the coast, this bold but wary marauder (locally known as the "Dun Crow") is generally abundant during the winter. To some extent he takes the place filled in warmer latitudes by the Vulture, and many a wounded hare or pheasant ultimately falls to his lot. In some districts if a duck be killed during the evening flight, and not retrieved, it is pretty sure to be found early the following morning completely picked by the "Dun Crows," the bare skeleton, with a few scattered feathers, alone remaining to mark the spot where it fell. Fresh-water mussels, *Anodonta cygnea*, are largely eaten by these Crows, and not long ago I watched a party of them engaged in searching for these molluscs, at low water, in the bed of the river at Blaxhall. To guard against a surprise, each bird took the precaution of flying with its prize to an open part of the adjoining meadow, before breaking the shell,—just as Rooks, in robbing a field of ripe wheat, carry off the ears to some bare spot, well away from the standing corn and all other cover, before eating them.

15th. Warm and showery. Saw one large and two small Tortoiseshell Butterflies. Frogs in full chorus to-night in a pond at Farnham.

17th. A specimen of *Helix nemoralis* abroad to-day, the first seen. When first noticed it was partly buried at the edge of a cottage door-step, under which it had perhaps hybernated. A few hours later it had crawled out on the grass some twelve inches or so.

18th. Wind west, very stormy. *Helix nemoralis* has been all day half buried against the wall of the cottage, but at half-past ten at night was crawling up the wall, and had reached a distance of about twelve inches above the ground. Half an hour later he was on his return journey, and within three inches of the sod.

19th. Heard the Wryneck for the first time. Saw some small Warbler, either a Chiffchaff or a Willow Wren, chased and bullied by a Sparrow. This morning a small hawk (I believe a male Sparrowhawk) made several ineffectual stoops at some little bird, which, after skilfully dodging its persecutor for some time, came straight towards me, and took refuge in a cottage garden. It proved to be a Blue Tit, and the bounding flight of the little fellow seemed plainly to express exultation and self-congratulation at having succeeded in baffling his enemy.

20th. Saw the first Yellow Wagtail, a beautiful male and very tame. Unlike some of our brighter-plumaged birds, this species is of a tame and confiding disposition, allowing one to observe its beauty, and the peculiar grace of movement common to all our British Wagtails, without the aid of a glass. The glowing yellow of the male, as he runs nimbly about the meadows in pursuit of insects, gives one the impression of an animated buttercup. Wagtails seem to have been particular favourites with that most gifted of animal painters, Rosa Bonheur; and in some of her beautiful cattle pictures these little birds are seen, running about among the drowsy beeves, in chase of their insect tormentors.

21st. First heard the Cuckoo. This, according to my notes, seems to be about the average date of arrival for this bird. A few days ago I met with a Grebe of some kind in the river, just above Langham Bridge; it was very tame, and allowed me to get pretty close before it took wing. After flying a little way it again pitched in the river. The seeking of safety in flight, rather than by diving, struck me as an un-Grebe-like proceeding. In size it seemed about intermediate between the Great Crested Grebe and Dabchick, and it may perhaps have been a specimen of *P.*

cornutus, Yarrell, but I was unable to identify it with any certainty.

24th. Heard a Green Woodpecker. Had a good view this morning of a Ring Ouzel. When first noticed it was on a piece of open ground sloping to the river, and surrounded by whin bushes. It afterwards flew up into some trees close to a farm-house, where it was joined by two other birds, thrushes of some kind, but whether of the same species or not I was too far off to determine.

25th. Noticed a pair of Bullfinches. These birds are, I fancy, commoner here than they were. It is a cheering sight, when passing along the country lanes in winter, to see a small family party of these little beauties flitting on in front, their bright colour sparkling like gems among the sober greys of the hedges. Owing to the arrangement of the hues, few in number and strongly contrasted, few birds show to greater advantage on the wing.

26th. Seven or eight Curlews on the mud-flats near the church to-day.

27th. First heard the Nightingale in Iken Wood. During a space of sixteen years I have found the average date of arrival of this bird, about here, to be April 18th. In only one instance, excepting this year, has it appeared later than the 24th; this was in 1884, when I first heard it on the same day as in the present year, *viz.*, the 27th. The earliest arrival noted is April 10th, in the year 1877.

28th. Noticed a pair of Common Whitethroats at Blaxhall. Humble Bees abroad in numbers. Among a number of young Moles which had been recently taken from their nests, some, equal in size to a full-grown Field Vole, were as yet without a vestige of hair. On others, rather older, it was just beginning to grow, and the skin had begun to assume a silvery grey look. Saw a male Whinchat close to the water's edge, and near it a Wheatear. The former, when in perfect plumage, is, I think, one of our prettiest small birds, but to fully appreciate its beauty a close view is necessary. The sober, but delicate and pleasing, tints of its plumage harmonize particularly well, and are rendered the more attractive by the arrangement of its markings. The flush of rosy fawn on the breast, fading gradually to the palest buff, has a beautiful effect when seen against a background of dark green furze, as the little fellow perches for an instant on the topmost twig of some bush close to the spectator. The more striking and conspicuous colouring of the pretty little Stonechat is sure to attract attention, even from a distance; but the exquisite colouring of the adult male Whinchat in spring is, I think, more apt to escape notice.

30th. Two Swallows were flying about this morning at Blaxhall. Taking an average of eleven years, I have found April 18th to be the time they usually arrive here. While in a plantation at Blaxhall I saw a pair of Rooks alight on the top of an oak; they then scrambled down lower, and began apparently to examine several twigs with their beaks, but in a particularly leisurely way. They remained on the tree about five minutes, and then flew to another oak. After a time one of them broke off a twig, and flew away, with its companion, in the direction of a neighbouring rookery. This is late for Rooks to be building, unless, as is probably the case, their first nest had been destroyed. In the above-mentioned plantation Bank Voles are now very numerous; though the cats kill a great many they do not seem to decrease in number, but rather the reverse. Last winter some of these little animals found their way into a small thatched building among the trees, used for storing apples and pears. A good deal of the fruit having been found partly eaten, and marked by the incisors of a small rodent, *Mus sylvaticus* was suspected, and traps set, with the result that several Bank Voles were caught. I found one this winter in a tool-house in a walled-in garden at Blaxhall. A box of hay had been placed there as a bed for a Hedgehog, which animal had, however, escaped from the garden. On removing this, some small animal jumped out, which I caught, and found to be a Bank Vole. Saw to-day a Starling, at Blaxhall, enter one of the nest-boxes placed under the eaves of the house, carrying in its beak what I feel sure was a "lamb's tail," or hazel catkin. Soon afterwards it brought in a bunch of moss,—rather unusual building material with the Starling.

MAY.

1st. Sand Martins have arrived at Iken Cliff. This morning I heard a Thrush utter its alarm note, having at the time a large worm in its beak. There is just now a nest of this bird at

Blaxhall, which is suspended, like that of a Goldcrest, on the under side of a spruce-fir bough.

2nd. Heard Norfolk Plovers calling this evening at about a quarter past eight. There seemed to be several, judging by the noise they made.

3rd. Saw three Starlings come out of Sand Martin's holes in the cliff. *Œdicnemus* very "crepitant" again to-night. First heard at about five minutes past eight.

5th. Saw this evening, at about eight o'clock, a single Norfolk Plover flying towards a bare part of the heath, much frequented by these birds. Two more afterwards passed me, going in the same direction and flying very low. They came from the Friston side of the river. There is, I think, a certain duck-like character about the flight of this interesting, but very local, bird.

6th. First heard the Turtle Dove. During a period of sixteen years the earliest arrival of this bird in East Suffolk, which I have a note of, was on April 20th, in the year 1876; the latest, May 22nd, in 1879. For ten years out of the sixteen it has made its appearance during the first week of May, and three times in the second week. This beautiful bird is generally abundant with us, and does good service by devouring the seeds of innumerable weeds. Like most pigeons it drinks very often. Many Turtle Doves come for this purpose to the sloping drinking-places made for the benefit of cattle in the marshes.

7th. Heard a Starling imitate the Curlew's whistle very perfectly. The notes of the Curlew, Heron, and Peewit are all constantly mimicked by Starlings here,—being perhaps the bird-sounds oftenest heard by them while seeking their food about the marshes and by the river. I have also heard this delightful bird reproduce the croak of the Mallard, the distant chattering quack of ducks on the wing, and the cheerful note of the Jackdaw. No Norfolk Plovers heard to-night.

8th. Saw to-day, at a distance, a large duck-like bird, apparently nearly all white, which puzzled me a good deal at the time. It was flying over the river, the flight being more like that of a goose than a duck. Heard a Corn Crake to-night not far from Snape Bridge: this by no means a common bird in this district.

9th. Again saw the bird noticed yesterday, in company with another like it, on the Friston saltings. Went to try and borrow a telescope, but without success. On returning, however, both birds got up and came across the river, passing me quite closely. I then saw that they were Shellducks. One alighted on the saltings on my side of the river; the other I lost sight of. Twice during the day I saw one bird alone, and hope by this that they may be nesting close by.

(To be concluded.)

THE GREAT SKUA (*LESTRIS CATARRHACTES*) IN FOULA.

By Richard M. Barrington, LL.B., F.L.S.

Yarrell states that, "as regards the British Islands, the only breeding-places of the Great Skua are in the Shetland group. One of these is in Unst, where the bird is carefully protected by Mr. Edmondston; and another is on the outlying island of Foula, the property of the Scotts of Melby, who do all in their power to maintain the scanty race."* Having recently visited the last-mentioned island, it may be of interest to the readers of 'The Zoologist' to have the latest report concerning one of the rarest of the sea-fowl which now breed in the British Islands.

We landed on Foula at midnight on June 22nd last, and were eight hours crossing in a fishing-smack from the mainland of Shetland, from which Foula is distant about eighteen miles. To the west of the island the cliffs are bold and striking, and form a jagged outline, which for imposing grandeur is hardly to be surpassed. On the east and north-east the island is comparatively low, with cliffs varying from 50 to 150 feet, but there is no strand or stony beach anywhere, save where a mountain stream enters the ocean at a little creek in the rocks, and this strip of beach is only ten yards across. Having hailed the natives by whistling and shouting, we ultimately aroused them by firing shots, and they put off a boat to the smack and rowed us ashore. At 1 a.m. our tent was up, and we turned into our blanket-sacks and lay down on somewhat uneven ground.

No Gaelic is spoken in Shetland, and, not as in the Outer Hebrides, one can converse easily with the natives on that account. Foula is about three miles long and two broad, and its highest point is the Sneug, 1372 feet. The highest cliff is the Kame, 1220 ft. There is an excellent 6-in.-to-the-mile Ordnance map of Foula. There are about 200 inhabitants. The old houses are all thatched; five or six modern ones are slated and have chimneys.

---

* 'History of British Birds,' 4th ed. vol. iii. p. 663.

The island is not only bleak and exposed, but subject to sudden squalls of exceptional violence from the steep face of the storm-swept Sneug, the home of the Great Skua, towards which we went. Ascending the steepest face of Hamnafeld (1126 ft.), over the little village of Ham, we went very slowly, botanizing all the way, and now and then looking round for birds. A single plant of *Listera cordata* was noticed, and towards the summit *Salix herbacea* occurred plentifully. Just then the first pair of Great Skuas appeared circling over the hillside at a height of about twenty yards. It was at once noticed that one bird was darker than the other. They were passing somewhat below us, and as they flew past the difference in the colour of the backs of the two birds was very evident. Soon three or four other pairs were seen, sometimes sitting on the soft mossy slope, side by side, or flying to and fro over certain parts of the hill. The northern face of the Sneug and of the two ridges which run to the east and west of it is very steep, with rocks and boulders and stones occasionally cropping out. The vegetation is short and closely cropped by sheep. The southern face has a gradual descent, and the surface is undulating, turfy and soft, consisting of moss, *Juncus squarrosus*, *Eriophorum angustifolium*, with straggling roots of *Calluna* and *Vaccinium uliginosum*. With one or two exceptions the Great Skuas all breed on the southern face. The nest is merely a depression on the surface. They seem to scratch a little at first, and then smooth the place with their breasts. In one or two cases some withered leaves of *Eriophorum* were round the edge, apparently broken off because they were in the way. Having heard and read so much about the boldness of the Great Skua in attacking intruders during the breeding season, there was at first some disappointment at their apparent want of courage. There were no eggs or young in any of the four or five nests; this might account for it. Away down the slope, about half a mile away, Richardson's Skuas were seen, and a nest found with two eggs.

Walking on towards the depression between the Hamnafeld and the Sneug, Great Skuas appeared more numerously, about ten pairs being observed within a radius of 200 yards. Many nests were met with, but not a single egg. Up to this the birds had not come nearer than ten to twenty yards, flying past and across us, now and then uttering a croaking noise, "ag—ag," and sometimes alighting within thirty yards. Presently a pair became very bold, and when passing would swoop towards us. Thinking eggs or young must be close by, a delay was made to search carefully, and both Skuas then attacked us vigorously, so that our sticks were involuntarily raised to prevent them striking our heads. The *modus operandi* was this:—the Skua would start about sixty yards off, on the same level as our heads, and fly straight at us, not deviating an inch, and increasing in speed, then, when within a yard or two of our heads, the feet were lowered, claws extended, and with a terrific "swish" and deep rushing noise of the wings, it would swerve upwards in a graceful curve, wheel then either to left or right, descend again to the level of our heads, and repeat the performance with greater or less vigour, according as we approached or receded from the nest. The nests were sometimes within ten yards of each other, but more frequently thirty to forty yards asunder. I must have seen over sixty, but all had been robbed save one, and this one contained a single egg. It was the only nest seen at a lower level than 800 ft., and probably escaped the searching eyes of the native egg merchant. W. was more fortunate, and found in one spot a few nests with one to two eggs and one young bird. The general impression left was that the Great Skuas were flying round their robbed nests, intending either to make new ones close by, or lay a second time in the old nests. Three times only was I attacked in that extraordinary vigorous manner which has made the Great Skua so noted for its boldness; but, were the nests not robbed, and three or four pairs of Skuas defending their young at the same time, few visitors would have the courage to face them without a stick. The natives told me that in some instances the Skuas knock off their hats, and have broken their wings against a stick suddenly held up as they swooped at the head of the intruder. No serious injury seems at any time to have been inflicted on a human being by a Skua. The birds probably weigh four or five pounds, and this weight striking a man on the head, and coming at such a velocity, would certainly kill him.

In every case in which a pair of Great Skuas were seen together, as if nesting, one bird was dark and the other light coloured, and the inference was that the colours might be sexual. For three days I was frequently among them, and having consulted the few books at hand, and finding no mention of this easily-observed difference in colouring, a dark bird was shot on a portion of Foula remote from the breeding grounds, and next day a light one was procured in another part of the island also at a distance from the breeding grounds. The dark bird turned out to be a male and the light one a female. The dark one was rather smaller, with bill and claws not so stout as in the light bird. Whether the colouring is associated with age or sex, or merely a phase which both sexes may present, as in Richardson's Skua, I cannot say. The fact that the dark bird is smaller may have been accidental, for the difference in size was not detected when the birds were sitting or flying past; but if not accidental, and constant, the stouter and older-looking bill and claws in the light Skua is in favour of the age theory. Then the fact that a dark bird *seemed* always *paired* with a light one, and that they were about equally numerous, is in favour of the sex theory; and lastly, the fact that in one or two cases the distinction in colour was not so decided is in favour of the phase theory. When the Skuas were sitting on the ground, side by side, the difference in coloration was in every instance noticed.

When on the steamer going to Shetland, a gentleman, who said he knew it well, told us that there were only two pairs of Skuas now left on Foula. We heard later, however, that eighty-four pairs bred there last year, and this year we ourselves saw between seventy and eighty pairs. By three different old men on the island I was informed that when they were boys the "bonxies" were not nearly so numerous as at present; that the proprietor, Mr. Scott, of Melby, protected them, and they increased greatly, but that for the last four years they have been diminishing in numbers. This is no doubt due to the fact that the Foula men themselves have become egg-dealers, and have been supplied with egg-drills, &c., for blowing, and that they take all the first batch of eggs laid and most of the second. Last year the "bonxies" did not get away with their young until August, and then only a few. Besides this persecution, I was informed that an excursion steamer came there, and that the excursionists shot numbers of "bonxies," and thirteen dead ones were picked up on the hill after they left. It may be that some readers of 'The Zoologist' will add my name to the list of those who have contributed to exterminate the Great Skua from its remaining haunts in Great Britain, but it should be observed that not a single egg was purchased or taken by me, and it was only after great hesitation that I could summon courage to shoot one at a distance from the breeding place. My friend shot another, against my wish, but he has thereby enabled me to exhibit to others a well-marked variation in colour, not referred to in any book on British birds to which I have access.

In 'The Ibis' for 1883 (p. 230), Mr. Howard Saunders refers to a *dark*-coloured Great Skua in the Bayonne Museum, with large, coarse feet; but no book at hand refers to dark and light forms easily distinguishable and equal in number at the breeding station. Near the Kame my friend noticed a patch of the Shetland rarity, *Trientalis europæa.* A beautiful little plant this is, and, as it was the first time I had ever gathered it, it will always be associated in my memory with the Great Skua.

Richardson's Skua does not breed on the top of Sneug, nor anywhere near the top; the Great Skuas reserve this for themselves, and if a Richardson's Skua happens to fly near the big fellows above, he is immediately attacked and driven down. Richardson's Skua breeds on harder ground, with less vegetation, than the Great Skua. The Great Skua nests on the mossy turf on the southern slope of the Sneug and its two ridges. Richardson's Skua breeds in several places in small numbers. The lowest half of the steep northern face of the Sneug, and two places low down on the southern face, as well as here and there on the less frequented parts of the moorland, may be mentioned. On the whole Richardson's Skua is not so numerous as the Great Skua, and there are at most not more than sixty pairs scattered over the island. We observed about three dark Richardson's Skuas to one white-breasted one; the coloration is not sexual but the light birds uttered occasionally a low, subdued cry, which I never heard from the dark bird. Both forms were desperately noisy compared to the Great Skua, and they reminded one, by their cries, of a colony of Kittiwakes. Like the Great Skua they attacked us when approaching the nests, and showed even greater audacity.

MEMOIR OF THE LATE W. K. PARKER, F.R.S.

The saddest task which can fall to the lot of an editor is that of chronicling, from time to time, the loss of a valued friend and contributor; and when, as in the present case, the hand of death has been laid upon one who shone conspicuously amongst his fellow-men, the task is indeed a heavy one.

It would be difficult to overrate the loss which zoological science has sustained by the death of William Kitchen Parker, which occurred suddenly, at Cardiff, on the 3rd of July last; for, as an exceptionally skilled anatomist and a most original worker, he held, in his own particular line of research, an almost unique position—a circumstance the more remarkable by his being in a great measure a self-taught man.

Deprived of the advantages of a University education, and without any of those aids to learning which are afforded by the Science Schools of the present day, he owed all the knowledge which he acquired to an intense love of Nature prompting and developing a taste for original research, which, in spite of many obstacles, he assiduously cultivated to the last. Few men probably have commenced a scientific career under greater difficulties than he must have experienced; but his indomitable energy and perseverance, combined with natural talent, eventually placed him in the foremost rank of modern scientists.

Born in 1823, the son of a farmer, at Dogsthorpe, near Peterborough, his early days were spent first at a school at Werrington, and subsequently at Peterborough Grammar School, under the head-mastership of the Rev. W. Cape. While still a youth he was apprenticed to Mr. Woodroffe, a chemist at Stamford, with whom he remained for three years, and it was here that he enjoyed opportunities for studying the varied fauna and flora of some of the then undrained fen-lands. We have heard him descant with rapture on the insects, birds, and plants which were to be found in Borough Fen, Thorpe Fen, and Whittlesea, Deeping and Crowland; and it is curious to note that, in the prosecution of a taste for Natural History, he began work as a botanist. Although engaged all day in business, he would rise in summer at 4 a.m., and, with a fellow-apprentice, would spend three or four hours daily in investigating the flora of the district. In two years he had collected and named more than 500 species of plants, and was often quite exhausted when he returned home to breakfast and to the less congenial work of the day.

On leaving Stamford he became apprentice to Mr. Costal, a medical practitioner at Market Overton, in Rutlandshire, where he acquired the rudiments of surgery and human anatomy, which eventually determined his choice of a profession. In December, 1844, he proceeded to London, and became a medical student at Charing Cross Hospital, and subsequently Demonstrator of Physiology to Mr. (now Sir William) Bowman and Dr. Todd at King's College. During this time he resided with the family of a Mr. Booth, a general practitioner, in Little Queen Street, Westminster,—eventually, in 1849, settling down in practice on his own account, in Tachbrook Street, Pimlico, where he married, and resided for many years.

While at King's College he made many beautiful injected preparations of organs, and laid the foundation for his later microscopical work on the Foraminifera. It was as a student of these minute organisms that he first came before the scientific public, in 1857, when he began to publish, in conjunction with his friend Prof. Rupert Jones, a series of valuable papers in the 'Annals and Magazine of Natural History' (1857—65), in the 'Quarterly Journal of the Geological Society' (1860), and in the 'Philosophical Transactions' (1864). The important share which he took in the preparation of Dr. Carpenter's 'Introduction to the study of the Foraminifera,' published in 1862, by the Ray Society, in a quarto volume of more than 300 pages, with twenty-two beautiful plates and numerous woodcuts, has been fully and freely acknowledged by Dr. Carpenter in his Preface to that volume. Under the auspices of the same Society he produced, in 1868, his Monograph on the structure and development of the shoulder-girdle and sternum in Vertebrata. As a draughtsman he particularly excelled, and much of the value attaching to the numerous memoirs published by him was due to the excellence of the plates which he himself prepared.

No man could have worked harder at science, in the intervals of professional duties, than he did, and it is scarcely surprising that the very short intervals which he allowed himself for rest eventually told upon his health and compelled him for a time to give up some of his practice. But, like a true naturalist as he was, he allowed his love of science to triumph over a desire for worldly gain, and it was well known to his friends that some of his best scientific work was accomplished during actual physical suffering, furnishing him, as he said, with a pleasant distraction from his ailments. One after another he completed most valuable papers on the morphology of the skull, dealing in turn with the *Ostrich* (Proc. Roy. Soc. 1865, and Phil. Trans. 1866), *Parrot* (Proc. Zool. Soc. 1865), *Common Fowl* (Phil. Trans. 1869), *Frog* (*ib.* 1871), *Eel* ('Nature,' 1871), *Crow, Tit, Sparrowhawk,* and *Thrush* (Monthly Microscopical Journal, 1872-73), *Salmon* (Phil. Trans. 1873), *Pig* (*ib.* 1874), *Woodpecker* (Trans. Linn. Soc. 1875), *Passeres* (Trans. Zool. Soc. 1875), *Batrachia* (*ib.* 1876), *Salamanders* (*ib.* 1877), *Sharks* and *Skates* (*ib.* 1877), *Snakes* (Phil. Trans. 1878), *Lizards* (*ib.* 1879), *Chamæleons* (Trans. Zool. Soc. 1880), *Crocodiles* (*ib.* 1883), and *Green Turtle* ('Challenger Reports,' Zoology, vol. i.), *Sturgeon* and *Lepidosteus* (Phil. Trans. 1882), *Edentata* and *Insectivora* (*ib.* 1886), and the development of the wing of the *Common Fowl* (*ib.* 1888). A portion of the above work was summarised in 1877, with the aid of his friend Mr. Bettany, and, under the title of the 'Morphology of the Skull,' was published in a single volume.

Meantime, in 1864, he had joined the Zoological Society, when the Council paid him the high compliment of remitting the usual composition fee, an example which was followed by the Council of the Linnean Society a few years later. In 1865 he was elected a Fellow of the Royal Society, receiving soon afterwards the Royal Medal, and in 1871 became President of the Royal Microscopical Society, to whose 'Transactions' he had already communicated important papers.* In 1874 he was appointed Hunterian Professor of Comparative Anatomy at the Royal College of Surgeons, where he lectured for ten years, giving, in his own quaint and discursive way, the results of much original research. His Hunterian Lectures for 1884, on "Mammalian Descent," were published in book-form the following year.

This by no means exhausts the summary of work done by him. Ornithologists especially owe him a debt of gratitude for the valuable help given them in many other papers published by him besides those above noticed, and in particular we may mention his article on the Anatomy of Birds, contributed to the last edition of the 'Encyclopædia Britannica.'

---

* For his presidential addresses to this Society see the 'Monthly Microscopical Journal,' 1872, pp. 89—97, and 1873, pp. 97—102.

Besides this, and in addition to the various papers on the Avian skull above referred to, the following may be specially noted:—

On the osteology of *Balæniceps rex*. Proc. Zool. Soc. 1860, pp. 324—330, and Trans. Zool. Soc. 1862, pp. 269—351.

On the osteology of the genera *Pterocles*, *Syrrhaptes*, *Hemipodius*, and *Tinamus*. Proc. Zool. Soc. 1862, pp. 253—260.

On the systematic position of the Crested Screamer (*Palamedia chavaria*). Proc. Zool. Soc. 1863, pp. 511—518, and Ann. Mag. Nat. Hist. 1864, pp. 144—150.

On the skeleton of the *Archæopteryx*, and on the relations of the Bird to the Reptile. Geol. Mag. 1864, pp. 55—57.

On the osteology of the Kagu (*Rhinochetus jubatus*). Proc. Zool. Soc. 1864, pp. 70—72; Ann. Mag. Nat. Hist. 1864, pp. 385—387; Proc. Zool. Soc. 1868, p. 2; and Trans. Zool. Soc. 1869, pp. 501—521.

On the sternal apparatus of Birds and other Vertebrata. Proc. Zool. Soc. 1864, pp. 339—341.

On the osteology of *Microglossa alecto*. Proc. Zool. Soc. 1865, pp. 235—238, and Ann. Mag. Nat. Hist. 1865, pp. 134—138.

On the osteology of Gallinaceous Birds and Tinamous. Trans. Zool. Soc. 1866, pp. 149—241.

Preliminary Notes on some Fossil Birds from the Zebbug Cave, Malta. Proc. Zool. Soc. 1865, pp. 752, 753, and Trans. Zool. Soc. 1869, pp. 119—124.

Memoir on Ægithognathous Birds. Part I. Trans. Zool. Soc. 1873, pp. 289—352; Part II. 1876, pp. 251—314.

On the systematic position of the Swifts (*Cypselidæ*). Zoologist, 1889, pp. 91—95.

At the time of his death he had in hand a memoir on the Morphology of the *Anatidæ* and the *Alcidæ*, designed to form one of the 'Cunningham Memoirs' published by the Royal Irish Academy; and an important paper on the Morphology of the Gallinaceous Birds, accepted for publication by the Linnean Society, the plates for which had fortunately been drawn by him and lithographed under his direction by his son, Mr. M. P. Parker. It is much to be regretted that he has not lived to revise the proof-sheets of this his last contribution to Zoology.

No man ever laboured from a purer love of Science. In his devotion to the study of Embryology and primitive types, he seemed to personify "the philosophic naturalist" depicted by the late Dr. W. B. Carpenter in the Preface to his work on the Foraminifera.*

He was a large-hearted and generous-minded man, without one particle of jealousy in his composition; and though, as an anatomist and physiologist, he was possessed of knowledge which many a one might envy, he never in the least degree seemed conscious of it. On the contrary, he seldom lost an opportunity of expressing his obligations to other people. It was a pleasure to ask him for information, for he gave it so fully and so freely.

Those who had the privilege of listening to his lectures will not easily forget the enthusiasm with which he would descant on the discovery of some beautiful adaptation of structure to habit, or the reverent admiration with which he always referred to the wisdom of the Creator as displayed in the creation.

NOTES AND QUERIES.

MAMMALIA.

The Irish Wolf-dog in Spain.—In some interesting notes communicated to the Royal Irish Society in January last (Proc. R. I. Acad. 3rd ser. i. pp. 333—339), Prof. J. P. O'Reilly gives some extracts from Bowles' 'Introduccion á la Historia Natural y á Geografia fisica de Espana,' 1775, showing that the so-called wolf-hound was at that date distinguished from the greyhound, and that the former was introduced into Spain from Ireland. The Spaniards call the greyhound *galgo*, as having obtained it first from Gaul; the wolf-hound they call *perro lebrel*, and several of the older dictionaries, as those of Delpino (1763), Pinedos (1740), and Stevens (1724), expressly explain *lebrel* to be "An Irish greyhound, though some will use it for a common greyhound, which is not proper, these being called *galgos*." Commenting upon the derivation of the word *loup-garou* (were-wolf) given by the Abbé Espagnolle, in his remarkable work 'L'Origine du Français,' 1888, vol. ii. p. 292, Prof. O'Reilly remarks:—"Comparing the form *loup-brou* = *leu-brou* with the Portuguese *lebreo* = *lebre* = Spanish *lebrel*, it may be taken that the word *lebrel* originally meant a lynx, or *loup-cervier*. Hence the *perro lebrel* mentioned by Bowles would really mean a wolf-dog." The pith of his communication is to be found in the following quotation from Bowles, who, an Irishman by birth, spent many years in Spain, and died in Madrid at an advanced age in 1780;—"The ordinary wolves (*lobos comunes*) are rare, either because there are but few small cattle, or because—the whole country being covered with farms (*caserías*)—should one be seen he is at once hunted and killed, for which work are excellent the greyhounds which they have brought here from Ireland—*para lo qual son excellentes los perros lebreles que hay alli trahidos de Irlanda*." Prof. O'Reilly concludes:—"Taking for granted that there was an importation of Irish wolf-dogs in Spain during the seventeenth and commencement of the eighteenth centuries, it would be reasonable to presume that the race of these dogs may still be surviving in Biscay, or other parts of the Pyrennees where wolves still exist, and the climate of this mountainous district would not materially tend to the degeneration of the race." I may add that there is evidence of Irish wolf-hounds having been sent to Spain prior to the seventeenth century. In 1545, as I have pointed out in an article on the subject (Essays and Reviews, p. 62), Henry VIII., at the request of the Spanish Duke of Alburquerque on behalf of the Marquis Desarya and his son, ordered the delivery to them out of Ireland of two goshawks and four greyhounds yearly, the cost of which was to be defrayed by the Treasury.—J. E. HARTING.

---

* "As it is the aim of the physical philosopher to determine what are the fewest and simplest assumptions, which being granted the whole existing order of Nature would result; so the aim of the philosophic naturalist should be to determine how small a number of primitive types may be reasonably supposed to have given origin by the ordinary course of 'descent with modification' to the vast multitude of diversified forms that have peopled the globe during the long succession of geological ages, and constitute its present Fauna and Flora."—Carpenter, 'Introd. to the Study of the Foraminifera,' 1862; Preface, p. xii.

Destruction of Otters in the Thames.—Some correspondence on this subject has been printed lately in the 'South Bucks Standard,' and a letter from our contributor, Mr. A. H. Cocks, which appeared in the issue for June 20th, is so much to the point that we are glad to give it a wider circulation by reprinting it here. Mr. Cocks writes:—"In common, no doubt, with a large number of your readers, I was very glad to see the letter in your last issue, signed 'Another Marlow Sportsman,' protesting against the senseless persecution of the Otters. As one who has kept live Otters, tame and wild, for more than twenty-one years—without a break for the last seventeen and a quarter—sometimes having several specimens in my possession at once, and who has observed their habits pretty closely in a wild state as well, I may claim to speak with a certain amount of authority about them; and I assert with confidence that they do very little harm to the fishing—quite an inappreciable amount, in fact. Of course they feed principally on fish; but I think the keenest angler must be very small-minded indeed who believes that there are not plenty of coarse fish for all the two-legged and four-legged anglers as well, without their interfering with each other's sport. A more serious charge, however, and the only one, I fancy, that real sportsmen prefer against them, is that they have been known to take large trout off the spawning-beds. This charge has been unquestionably much exaggerated; the few instances where a trout has been found partly eaten by an Otter have been so continually talked of that everyone has come unconsciously to consider it as almost a common occurrence. The remains of a large trout, partially eaten by an Otter, were brought to me here some few years ago. It was a foul, lanky old kelt—that is, a spent fish, with a hide like boot-leather, and if not already dead, was probably *in extremis* when the Otter took it from the water. No doubt a few other persons could tell us of similar instances. In all probability all, or nearly all, of these few trout so captured by Otters were spent fish—old kelts (kippers or baggits), who had safely stowed some 10,000 or more eggs on the river's bottom, and would in many cases have died even if an Otter had not 'saved them the trouble.' The Otters probably did actual good in removing them, for it is difficult to conceive how many thousands of the embryo trout would have been poisoned by the decayed matter exuding from the decomposing body of even one big fish dying right on the spawning-bed. Again, probably very few of your readers are aware how prevalent the Salmon-disease is in the Thames, although, owing to Barking Creek and other pollutions, there are now no Salmon to be affected by it. I have a return, given me some years ago by the late Frank Buckland, showing the number of Salmon caught hereabouts during the last twenty years in which any found their way up, which I will gladly publish in a future number, if of general interest. The Salmon-disease is caused by, and consists in, a fungus, called *Saprolegnia ferax*, and in the spring months of some years—possibly every year—some species of the coarse fish die in large numbers from its attacks. This fungus spreads with marvellous ease (I learnt a little about it by keeping and observing fish in aquaria); and until that happy day arrives—it seems far enough off at present—when Thames water shall again be as pure, and as free from all pollutions, as it was in primeval times, I can think of no means so effectual for checking the spread of this most fatal fungus as to encourage, by every possible means, the few Otters remaining along the river side, who unquestionably remove a large number of these diseased (and highly contagious) fish from the river on account of their being so easy of capture. As an ounce of fact is worth pounds of theory, I may mention that I have never found an Otter make any objection to eating a fish affected with the disease, nor have I ever found one any the worse for doing so. But, after all, anglers are not the only class of persons for whom the river exists, although I do not mean to say one word against them, for there was no one in Marlow who fished as regularly as I did when at home, from the time I was a very small boy, until during these latter years I have been choked off by the steamers and multitude of boats, which quite put an end to sport. If the boating fashion were to come to an end again, I should again go fishing; so that I do not intend to say anything against anglers; but there are other classes of persons who enjoy the river, who have as good a right to have their interests respected, even if they should seem at first sight in any way antagonistic to those of the anglers. Among these are naturalists, or lovers of nature; and if I cannot any longer (in the Thames) be a fisherman, I cannot help remaining (at least) a lover of nature; and it is a very great pleasure to me—and doubtless to many others—when I go on the river, or along its banks, to observe where the Otters have been. A family—as just now is the case above Temple Lock—will sometimes occupy a reach for some time, and it is then extremely interesting to visit the locality frequently, and read, almost as a book, what the Otters have been about since one's last visit. I could have shot four Otters in the Thames near Marlow; on each occasion I had my gun with me. On one of these occasions I actually had the gun pointed at the Otter,—thinking it was a water rat,—but, finding out what it was just before I pressed the trigger, I at once lowered the gun, and was rewarded for my forbearance by catching the Otter by hand. I kept her alive for years afterwards, when she was killed by another Otter biting her in the head. Besides fish, Otters eat frogs, mussels, worms, &c., and as a very large majority of people have a horror of snakes, they may like to know that an Otter very much appreciates a snake as an article of diet. After all, Otters are not numerous; on many rivers they are now almost unknown. A very few more years of this unmeaning persecution, and goodbye to one of the most interesting, and certainly the most intelligent, of our few remaining wild animals. I wonder no one, before your correspondent of last week, has objected publicly to the awful trap that is employed to catch the unfortunate Otters by the Temple lock-keeper. One of the Otters he captured, which was brought to me, was a strong, full-grown male animal (his dimensions and weight were given in the columns of a contemporary, but the figures would have to be discounted by about 20 per cent. before they agreed with mine), but the trap had almost cut his leg off; the tough skin and the powerful muscles were divided, and the bones were broken, so that the foot simply hung by the ligaments. Such a trap is big enough and strong enough to hold a leopard!—much more a small animal like an Otter. It would break the leg of any dog that happened to stray into it, and woe to any child on whose ankle the trap were to close. It would be agony even to the toughest adult person. Not only does it strike high from its great size, but it is closed by two very powerful springs, and besides the cutting caused by the jaws, there are the formidable cross spikes to which your correspondent calls attention; they would penetrate anyone's ankle on each side (speaking from memory) to a depth of over an inch.—A. H. Cocks (Thames Bank, Great Marlow).

BIRDS.

Barred Warbler in Ireland.—On his return from Belmullet, a few weeks ago, my friend Mr. R. J. Ussher sent me, for determination, a warbler, which turns out to be a female Barred Warbler, *Sylvia nisoria*, now to be for the first time recorded as an Irish bird; and I am glad to say that Prof. Newton, who has very kindly examined the specimen, confirms my identification. Mr. Ussher informs me that the present example was obtained, by the venerable ornithologist Dr. Robert J. Burkitt, at Belmullet, in the remote north-west of Mayo, on the 24th September, 1884, about the same date when several others were captured in England. To Dr. Burkitt Irish Ornithology is already indebted for the record of the Great Auk, the Gold-vented Thrush, and the Spotted Eagle Owl, all of which he obtained in the vicinity of his former residence at Waterford; and it is interesting to find one who commenced collecting birds in 1839, and is now eighty-four years of age, adding one more rarity, *Sylvia nisoria*, to the Irish avifauna.—A. G. More (Science and Art Museum, Dublin).

Protective Colour of Birds' Eggs.—On July 7th, while walking with a friend on the Wicklow coast, near Kilcoole, I found a nest of the Ringed Plover, with three eggs, after a long and careful search, having seen the bird near the spot running along the shore. I drew my companion's attention to the admirable manner in which these eggs, laid without shelter on the open shore, were protected from discovery by their resemblance to surrounding objects, and, for our amusement and instruction, I made the following experiments:—Walking backwards and keeping my eyes fixed on the nest, I found that the eggs ceased to be visible at about fifeen yards; at ten yards they were conspicuous as long as the eye was fixed on them, but on my turning my back to the nest for an instant it was some minutes before I could see the eggs again. This for myself, who am well accustomed to finding nests such as this. My companion found that while there was no difficulty in seeing the eggs at ten yards as long as the eye was fixed on them, yet on looking away for a moment he could not find them again, and even when I walked to within three paces of the nest, and pointed at it with my walking-stick, it was still several minutes before he again caught sight of the eggs. Once seen they were quite conspicuous. Near the same place we found some nests of the Lesser Tern after a very long search, having seen the birds rise from the shore. From the foot-marks, it was evident that, while searching, one of us had actually stepped over a clutch of three eggs lying in the sand, without seeing them. In a neighbouring field, among the shingle and *débris* on the edge of a tidal creek we found a Lapwing's nest with three eggs, having seen the bird leaving them. So closely did these eggs resemble their surroundings that at five yards they were practically invisible, though there was absolutely nothing to interrupt the view, and neither of us could discern the eggs again, having once lost sight of them, without walking back right up to the spot where we knew the nest to be.—ALLAN ELLISON (Trinity College, Dublin).

Occurrence of Ægialitis asiatica (Pallas) in Norfolk.* — The true home of this beautiful Plover appears to be Western Asia, more especially the shores of the Caspian Sea, whence in winter it passes by the Red Sea shore and Abyssinia, to South and South-west Africa. In the western palæarctic region Mr. Dresser speaks of it as a rare straggler, but it has occurred twice in Heligoland, and strange to say at very opposite periods of the year, namely, a young bird in November, 1850, and an adult male, in full summer plumage, on the 19th May, 1859. These, until the occurrence of which I am about to speak, are the most westerly examples recorded; but Mr. Harting, in an excellent article "On rare and little-known *Limicolæ*," contributed to 'The Ibis' in 1870 (2nd series, vi. pp. 201—213), concludes some remarks on the distribution and routes of migration of this species with the observation that it is quite possible, on some future occasion, the bird may occur in England. It was with no little pleasure, therefore, that on the evening of the 23rd of May, 1890, I received from Mr. Lowne, of Yarmouth, the fresh skin of a handsome full-plumaged male of this species which he sent for determination, as the bird was unknown to him. I subsequently learnt the following particulars with regard to this interesting occurrence. During the morning of the 22nd of May, a date very nearly coinciding with the second appearance of the Caspian Plover in Heligoland, two strange birds were seen in a large market-garden, known as Sacret's Piece, bordering on the North Denes, at Yarmouth, which attracted the attention of a man named Samuel Smith, who works the garden for a Mr. Bracey, but he had no opportunity of a shot. About 5.30 p.m., when they were on the golf ground, which forms a portion of the denes, Smith's step-son, Arthur Bensley, saw them, and having a gun with him tried to get both birds in line for a double shot, but being unsuccessful selected the brighter of the two, its companion being at the time about six yards distant from it; when he fired the paler bird, presumably the female, flew off in a westerly direction, and was no more seen. Very shortly after, the bird was purchased of Smith by Mr. H. C. Knights, by whom it was shown in the flesh to Mr. G. F. D. Preston, and taken the next morning to Mr. Lowne for preservation; he, as before stated, forwarded the skin to me the same evening. The weather being very warm at the time, Mr. Lowne would not risk sending the bird in the flesh; hence it was that I saw only the skin, but I may mention that it had all the appearance of having been very recently removed, and that there were still many living parasites remaining on the feathers. Mr. Gurney also saw the skin while it was in my possession. The sternum Mr. Lowne sent to Professor Newton. The total length of the bird when in the flesh, Mr. Lowne tells me, was eight inches, and its weight two and a quarter ounces [?]. Mr. Knights was good enough to give me the first offer of the bird, and through the liberality of some friends of the Norwich Museum I was enabled to purchase it for that institution, and to send this first British example for exhibition at the meeting of the Zoological Society, on the 17th of June last. In Mr. Dresser's figure of this species the tints of the plumage are not quite so bright as in the freshly killed bird before me, and the conspicuous black border below the chestnut pectoral band is wanting, although it is mentioned in the verbal description; the legs also are coloured, and described as "ochreous-yellow"; but in the Yarmouth bird they were, when fresh, undoubtedly "greenish ochreous," as described in the 'Ibis' by Mr. Harting, a hue which Mr. Dresser states "is certainly an error," but which in this case I can confirm. Mr. Harting's otherwise excellent figure is much darker in colour than the Yarmouth specimen. In neither of the figures referred to has the bird the appearance of standing so high on the legs as in the example now recorded. I submitted the parasites before mentioned to Dr. E. Piaget, who was kind enough to inform me that they are a new species, for which he proposed the name of *Nirmus assimilis*.—T. SOUTHWELL (Norwich).

---

* Extract from 'The Birds of Norfolk,' vol. iii. (now in the press).

Breeding of the Woodcock in Ireland.—On July 14th I was informed that there was a Nightjar's nest in the neighbourhood containing *four* eggs! As I was curious to see a Nightjar's nest with that number of eggs, I determined to visit the place. My informant showed me the way, and, arriving near it, pointed out the exact spot. I soon caught sight of the large black eyes, not of a Nightjar, but of a Woodcock, crouching low under a frond of bracken. Allowing me to approach within only a few feet of it, it suddenly rose with a loud flutter, and disappeared with a rapid zigzag flight. The nest contained four eggs. I send this note because in all the text-books on British birds which I have, only incidental mention is made of a second brood being reared, and, strange to say, all the instances mentioned are recorded as having occurred in Ireland. Mr. Butler ('British Birds' Eggs,' p. 143) mentions, under "Time of nidification," the month of March only. Mr. Harting, in his most interesting article "On some little-known habits of the Woodcock" (Zool. 1879, p. 439), mentions the case of a bird carrying its young on the 2nd of August, 1871, at

Rostrevor, Co. Down. Several instances of a second brood having been reared are given in Thompson's 'Natural History of Ireland,' vol. ii. p. 247. It is curious to read the account of this bird's first nesting in Ireland, given in the last-mentioned work. It appears that the earliest record is fifty-six years ago, when a pair bred in the Co. Antrim in 1834. Since then there are records of its having done so in Armagh, Carlow, Down, Queen's County, Sligo, Tipperary, Waterford, Wexford, and Wicklow. No doubt it has nested in other counties also. The Woodcock is common in this neighbourhood throughout the year: an evening is an exceptional one when I do not see one or more birds on the wing. I always know when one is coming by its peculiar clicking note, which once heard can never be forgotten. — WILLIAM W. FLEMYNG (Clonegam Rectory, Portlaw, Co. Waterford).

Dunlin breeding in Co. Wicklow. — It may perhaps be worth recording that on May 27th I found the nest of the Dunlin on the Wicklow Mountains near the source of the Liffey. Here is a vast extent of wild, swampy moor, perhaps, on an average, 1700 feet above the level of the sea, and surrounded by the highest summits of the North Wicklow Mountains. The bog is studded with small ponds of peaty water, and is mostly covered with moss, mixed with stunted heather and patches of cotton-grass or rushes. The Golden Plover and Curlew breed on these moors, and not far off are precipices containing eyries of the Peregrine and Raven. While crossing the bog, threading my way with some difficulty among the marsh-pools, I saw a Dunlin perched on a moss-tussock. After searching the spot for some minutes, I almost trod on the sitting female, who fluttered away just at my feet, leaving her nest, with three eggs a good deal incubated. The nest was merely a hollow in the moss, surrounded by a few bents and lined with scraps of grey moss and little bits of heather-stems. Mr. More, in his 'List of Irish Birds,' only mentions the Dunlin as breeding in the West and North of Ireland.—ALLAN ELLISON (Trinity College, Dublin).

Wood Pigeons in the London Parks.—Since I wrote you two years ago respecting the Wood Pigeons in Hyde Park (Zool. 1888, p. 389) their numbers have so increased that I have given up all idea of counting them. I notice, however, this year, that a good many more of the fancy Pigeons come to feed with them on the lawn; and as a result of this, apparently, there is a young hybrid bird to be seen, evidently a cross between a Wood Pigeon and a fancy one. This bird, which is very tame, and which—with one or two other wild birds—will come and take white peas out of my hand, retains the sedate walk of the Wood Pigeon, but the plumage is very peculiar, especially on the back, rump, and upper tail-coverts. The tail is black and rather squared, and the head and beak light and rather small. To-day, after the rain, I counted a dozen Rabbits at feed in the dell; also a brood of young Waterhens, and several Blackbirds, Thrushes, and Starlings. Two of the Peahens also have broods of four and two each, which, mingled with all the varied life to be seen there, made it quite a red-letter day for this charming spot.—W. H. Tuck (47, Cathcart Road, South Kensington).

Nesting Habits of the Dipper.—There are probably few places in the British Islands where the Dipper is so abundant or so widely distributed as in the Co. Wicklow. Along the steep, rushing mountain torrents, as well as the larger and quieter streams of the lowland districts, it is alike everywhere present. Among the numerous Dippers' nests which I have examined, there are a few whose peculiarity may perhaps entitle them to a notice in 'The Zoologist.' The nest is usually placed in some crevice in the rocks or masonry over the stream, a niche in an overhanging river-bank, or a hole in the stonework of a bridge,—never in a tree.* The River Derry, in the south of Co. Wicklow, is a sluggish and weedy stream, the abode of pike and minnows, but it is quite as much favoured by these birds as its small rapid tributaries. The banks are for the most part low and grassy, and do not offer many suitable nesting sites; but I do not think there is a single bridge along its whole course that is not resorted to annually by a pair of Dippers. Under the arch is the most favourite spot for the nest, as the Dipper likes to have its domicile completely sheltered from above. Any accidental crevice or hole left in the stonework serves to receive the nest, which is occasionally built far in out of sight, but usually projects from the mouth of the hole, so as to be conspicuous to anyone looking through the arch. When the nest is at a distance from the entrance of the hole, it is generally a very imperfect structure, like that of a Wren or Sparrow under similar circumstances, the dome being almost completely absent; but such cases are, I think, rare, the nest being usually wedged, so to speak, in the entrance. But holes in the masonry are by no means indispensable for the Dipper's nesting purposes. I know of two bridges on the River Derry where a Dipper's nest is constructed almost every year on a flat stone projecting from the wall of the arch, less than three feet above the average level of the water. In one of these places the nest has a partial concealment, from some ferns and mosses growing from the stonework around the nest-shelf, the mossy nest being of the same hue as the surrounding objects. In the other place the stones around the nest-shelf are quite bare, and the nest is very conspicuous for some hundred yards along the river to anyone looking through the arch of the bridge, but by a casual observer would probably be taken for a sod or lump of river *débris* caught on the projecting stone. This nest was carried away by a flood last year before the young were flown, a thing which perhaps not unfrequently happens in wet seasons. About a mile down the river from these is a third bridge, where a nest was for many years constructed on the point of the buttress, partly concealed by grass and overhanging ferns, and about seven feet above the water. This nesting-place has been deserted, because the nest was invariably discovered by idlers leaning over the parapet (the bridge being near a village), and destroyed by dropping stones on it. There is another bridge about two miles below this, which is also frequented by a pair of Dippers. Here, however, the stonework being very perfect and devoid of crevices, does not offer any place where a Dipper's nest could possibly be fastened. Consequently this pair of birds are compelled to place their nest in the most extraordinary situations, and are, as far as I know, unique in their nesting habits. Under the middle arch of the bridge there is a stout post driven into the river bed, standing about three feet above the water. On top of this the nest was placed, being partly supported by a piece of paling-wire, which was lapped round the post, fastening to it a wooden rail, which was suspended by chains across the arch for the purpose of preventing cattle passing under the bridge. This nesting-place was resorted to for several years, a new nest being always constructed on the ruins of the old one, until a mass of materials had been accumulated sufficient to fill a good-sized wheelbarrow. It was visible for a long distance both up and down the river, but if discovered would certainly have been mistaken for a tuft of river *débris* entangled in the top of the post. A few years ago the cross-rail with the paling-wire, nest and all, were carried away in the winter floods by an alder tree which was swept down the river, and remained entangled in the post for a long time, until again swept away by a subsequent flood. Nothing now remains but the upright post, which is no longer able to support a nest. Last year, although the Dippers were constantly about the bridge, the nest was not discovered, and I am of opinion that they did not breed at all, for want of an available nesting-place. This year, however, I have again discovered their nest, and its position is, if possible, more curious than ever. On the lower side of the bridge, between two of the arches, there grows—partly out of the masonry of the bridge and partly on the stones in the bed of the river—a tussock of rushes, water-parsnip, and other weeds. In the centre of this the birds have constructed their nest. It is practically on the ground in the bed of the river, built in the tuft of weeds, just as a Willow Warbler's nest is built in a tuft of moss or grass. Viewed from the bank, or from over the parapet of the bridge, it looks just like a sod in the middle of the tuft. The current of the river dashes, rapid and foaming, through the arches on either side, and the nest—which is little more than a foot above the water—is constantly wet with the spray. When discovered, on April 11th, it was just completed, and ready for eggs. At the same time I knew of another Dipper's nest containing young ones, so that the structure of this one had probably been delayed owing to the flooded state of the river, the tuft of weeds in which it was placed having been but a fortnight previously submerged under two feet of water. Probably for this reason most of the Dippers' nests I observed this year were much later than usual. The earliest contained eggs much incubated on March 30th, but this was in a situation quite out of reach of even the highest floods. Generally these birds build very early. I saw a nest complete and ready for eggs on March 6th, 1886; but a few days after we had the heaviest snow-storm ever remembered in the district. The snow lay drifted in many places over ten feet deep during the whole of that month, accompanied by intense frosts. On the morning of March 3rd the thermometer at Shillalagh had registered 8° Fahr., and on the ground,—or rather the snow,—while the rivers were partly frozen. had fallen some degrees below zero. In spite of this severity the Dippers were able to carry on their nesting operations. Young Dippers frequently leave the nest before the second week of April, and the nests are sometimes commenced in February, but they may probably be later in some districts. I have frequently heard the Dipper singing on the wing in very early spring-time, while in amorous pursuit of his mate over the river.—Allan Ellison (Trinity College, Dublin).

---

* Three instances of Dippers' nests in trees will be found mentioned in 'The Zoologist' for 1888, pp. 309, 351, 392.—Ed.

Birds killed by Electric Lights at Girard College, Philadelphia.—During the spring and fall migrations of birds many dead ones are seen near the electric towers in the grounds. Last autumn quite a number were found, though not so many as the previous year, when a whole flock struck the electric tower at Ridge and South College avenue, in their migration to their winter quarters to the south. It is now an established fact that most birds migrate at night, and during a dark stormy one they are more likely to be attracted by the electric light. Among those dead or crippled were the Whip-poor-Will, *Caprimulgus vociferus* (a very rare bird with us), Peewee Flycatcher, *Sayornis fuscus*, American Robin, *Turdus migratorius*, Maryland Yellow-throat, Ground Warbler, *Trichus marylandica*, Brown Tree-creeper, *Certhia familiaris*, Wood Thrush, *Turdus mustelinus*, White-breasted Nuthatch, *Sitta carolinensis*, Hermit Thrush, *Turdus solitarius*, Song Finch, *Melospiza melodia*, sometimes called Song Sparrow. Many Woodpeckers and Tree Creepers were in the grounds, more than were ever noted before, the Downy Woodpecker busy at work making his ring of holes around the red elm, *Ulmus rubra*. The Tree Creepers have been his faithful assistants, though not having the power to make the holes he does. Both, no doubt, have done much good in ridding the grounds of the eggs and larva of worms that feed on the trees. The Barn Owl, *Strix americana*, put in an appearance last fall (a whole family of them: they are rare in Girard College grounds. Quite a number of Kinglets and

Viroes, or Greenlets, were seen, but they were too shy to be approached, so they could not be named. The Towhe Ground Finch, *Pipilo erythropthalmus*, also paid us his visit and departed; by the length of his name he might have paid us a longer one. The Fox-coloured Finch, *Passerella iliaca*, and many other birds of all the species above spoken of as killed, were also seen flying around, except the Whip-poor-Will.—F. H. DANENHOUR—'*American Naturalist.*'

MOLLUSCA.

Mollusca additional to the British List.—The following two varieties seem to be unrecorded by name as British, although possibly they exist in various collections: — *Defrancia purpurea* var. *bicolor*, Risso: a deep chocolate-brown specimen, variegated with white, was found by the Rev. A. H. Delap at Valentia Harbour, Ireland, and sent by him to me. *Phasianella pullus* forma *lineata* Monterosato: a specimen referable to this, from Darrynane Strand, Ireland (Delap), is minutely spotted, and has two darker bands composed of united triangular patches, so that the outline of the band is zigzag: this is not identical with the variety from Margate and Guernsey, which I called *lineata* in 1885.—T. D. A. COCKERELL (3, Fairfax Road, Bedford Park, Chiswick).

INSECTS.

Caterpillars destructive to Oaks.—All the oak trees in this part of North Wales (Dolgelly) have this spring been entirely denuded of their leaves, giving the woods the appearance of winter. This devastation appears to have been caused by the caterpillar of a small green moth (specimens enclosed). Earlier in the season the caterpillars were raining from the trees, now they are swarming with these moths. I have not noticed them in former years.—E. L. MITFORD (Dolgelly).

[The insect sent is *Tortrix viridana.*—ED.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

June 19, 1890.—Prof. CHARLES STEWART, President, in the chair.

Messrs. W. H. Beeby and H. E. Milner were admitted and Messrs. W. Cross and S. Schonland were elected Fellows of the Society.

Mr. W. H. Beeby exhibited a specimen of *Rumex propinquus* new to Britain, and procured in Shetland.

Mr. Thomas Christy exhibited and made remarks upon a specimen of *Callistemon rigidum.*

Mr. E. M. Holmes exhibited some marine Algæ new to Britain, including *Ascocyclus reptans*, *Halothrix lumbricalis*, *Harveyella mirabilis*, *Sorocarpus uvæformis*, and *Vaucheria litorea*. Also specimens of *Rhodymenia palmata* with antheridia, and *Punctaria tenuissima* in fructification, the last two not having been previously recorded to occur in this state in Great Britain.

The following papers were then read:—"Observations on the protection of Buds in the Tropics," by M. C. Potter; "On the distribution of the South American Bell-birds belonging to the genus *Chasmorhynchus*," by J. E. Harting; "On the vertical distribution of Plants in the Caucasus," by Dr. Gustav Radde; and "Notes on the *Forficulidæ*, with descriptions of new genera and species," by W. F. Kirby.

This meeting terminated the Session of 1889–90.

ZOOLOGICAL SOCIETY OF LONDON.

June 17, 1890.—W. T. BLANFORD, F.R.S., in the chair.

Mr. Sclater exhibited and made remarks on a mounted head of a Pallah Antelope, obtained by Capt. F. Cookson, on the Cunene River, in South-western Africa, which was distinguished by its black face from the ordinary form of the Cape Colony.

Mr. Sclater also exhibited a large photograph of Grévy's Zebra, *Equus grevyi*, taken from the specimen in the Natural-History Museum at Paris by Mr. Gambier Bolton.

A specimen of Pallas's Plover, *Ægialitis asiatica*, obtained in May last near Great Yarmouth, and now in the Norwich Museum, was exhibited; and a note upon its occurrence by Mr. T. Southwell was read to the meeting.

A communication was read from Prof. F. Jeffrey Bell, containing some notes received from Mr. Edgar Thurston, of the Madras Museum, on the habits of the Pennatulids of the genus *Virgularia*.

A communication was read from Mons. P. A. Pichot, containing exact particulars of the locality on the Lower Rhone in which the Beaver is still found in its native state.

Mr. W. Bateson read a paper on some cases of repetition of parts in animals, and exhibited a series of specimens illustrative of this subject.

Mr. Henley Grose Smith gave an account of the Diurnal Lepidoptera collected by Mr. W. Bonny, of the Emin Relief Expedition, on the River Aruwimi, Central Africa.

A communication was read from Mr. W. L. Distant, containing descriptions of some Hemiptera collected by Mr. W. Bonny during the same expedition.

A communication was read from Mr. H. W. Bates, on some of the Coleoptera collected by Mr. W. Bonny during the same expedition.

Mr. Herbert Druce read the descriptions of ninety-five new species of Lepidoptera-Heterocera from Central and South America.

Mr. G. A. Boulenger pointed out the secondary sexual characters in the South African Tortoises of the genus *Homopus*.

A communication was read from Mr. W. L. Sclater, containing a series of critical notes on the Indian species of the family *Muridæ*.

A communication was read from Mr. J. T. Cunningham, containing some notes on the secondary sexual characters of the genus *Arnoglossus*. The author showed that the so-called *Arnoglossus laterna* is only the female of *A. lophotes*.

Mr. R. Bowdler Sharpe read the sixth part of his series of notes on the Hume Collection of Birds. The present communication treated of the *Coraciidæ* of the Indian region, and contained descriptions of three new species.

A communication was read from Miss E. M. Sharpe, containing an account of a collection of Lepidoptera made by Mr. Edmund Reynolds on the rivers Tocantins and Araguaya, and in the province of Goyaz, Brazil.

Mr. Edmund S. Hall gave an account of the occurrence of a persistent right posterior cardinal vein in a Rabbit.

This meeting closed the Session 1889–90.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

July 2, 1890.—Prof. J. O. WESTWOOD, M.A., F.L.S., Hon. Life-President, in the chair.

Mr. J. B. Hodgkinson (Ashton-on-Ribble, Preston, Lancashire), and Mrs. Basett (Springfield, Reading) were elected Fellows.

Lord Walsingham exhibited some rare Micro-Lepidoptera collected by himself at Cannes, including *Eudemis helichrysana*, *Conchylis rubricana*, Millière; a new *Depressaria* from *Opoponax cheironium*, which is about to be described by M. A. Constant, and *Bucculatrix helichrysella*; and also a volume of drawings of larvæ of the genus *Eupithecia*, by Mr. Buckler, which formerly belonged to the late Rev. H. Harpur Crewe.

Mr. M'Lachlan exhibited larvæ and cocoons of *Mecyna deprivalis*, Walk., sent by Mr. W. W. Smith, of Ashburton, New Zealand; the species feeds commonly on *Genista capensis*, an introduced plant. Mr. M'Lachlan remarked on the curious nature of the larva, and suggested that as the species was so closely allied to *M. polygonalis*, so extremely rare in this country, they might be interesting to British lepidopterists.

Mr. Jacoby exhibited abnormal specimens of a phytophagous beetle, *Metaxonycha tridentata*, Jac., in which one side of the thorax was furnished with teeth as in the type, whereas the other side was quite simple, and presented no trace of teeth.

The Secretary, on behalf of Mr. J. Edwards, exhibited specimens of *Gyrinus colymbus*, Er., with specimens of *G. elongatus*, Aubé, for comparison; he also exhibited drawings of the œdeagus of both species proving their distinctness.

Mr. Bower exhibited *Phoxopteryx upupana*, bred from larvæ feeding between united birch-leaves at Chiselhurst, Sept. 1889; and *Scardia picarella*, bred from fungus collected in Durham in May, 1870.

Mr. S. Stevens, in speaking of a tour which he had lately made in Devonshire, remarked on the extreme scarcity of insects on the coast of that county as compared with the coasts of Kent and Sussex; there were very few larvæ, and the vegetation was very luxuriant and very little eaten: he thought it possible that the reason of the scarcity was the heavy rainfall of South Devon, which washed off and destroyed the young larvæ. Mr. Barrett said that his experience had been the same, and that he put it down to the violence of the winds which beat the insects from the trees. Mr. Blandford remarked that he had found Coleoptera abundant on Braunton Burrows, near Barnstaple, but very scarce in other localities. Mr. Mason and others took part in the discussion which followed.

Mr. Stevens further said that when at Exeter he visited the Museum, and was pleased to see the original specimen of *Plusia ni* in the late Mr. H. Dorville's collection, taken at Alphington, near Exeter, in August, 1868, and a specimen of *Callimorpha hera*, taken also at Alphington in August, 1871, which is about six miles from the locality in which the latter insect is now said to occur; both the specimens are in fine condition.

Prof. Westwood read a paper on a species of Aphis affecting the bread-fruit tree, which he had named *Siphonophora artocarpi*, received from Mr. E. Ernest Green, of Ceylon: at the conclusion of his paper he alluded to the use of Paris-green as a destructive agent for insects. Mr. Blandford then made some remarks as to the use of London-purple (another arsenic compound) as an insecticide in the place of Paris-green; he stated that the compound was a waste product and one-tenth the cost of Paris-green, and further that it was more soluble and more easily applied; he was also of opinion that arsenic compounds do not greatly affect sucking insects, such as Aphides, the ordinary kerosene preparations being more suitable for their destruction. Several Fellows took part in the discussion that followed.—W. W. Fowler, *Hon. Sec.*

BRIT. MUSEUM
3 DE 90